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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BROPHY, MATTHEW J	

ART UNIT	PAPER NUMBER
2191	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,916	BROUSSARD, SCOTT J.	
	Examiner	Art Unit	
	MATTHEW J. BROPHY	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 March 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to amendment filed January 3, 2008.

2. the 35 U.S.C. §101 rejection of claims 11-30 has been withdrawn in view of applicant's amendment.

Response to Amendment

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims rejected under 35 U.S.C. 103(a) as being unpatentable over as being anticipated by US PG Publication 2004/0078540 Cirne et al. hereinafter Cirne. In view of US Patent 7,089,460 Fu hereinafter Fu.

Regarding Claims 1, 11 and 21 Cirne teaches: A method [system, or article of manufacture] for detecting memory leaks in a software program, said method comprising the steps of: monitoring a specified one or more analysis properties of software objects executing in the software program **(Cirne Paragraph "[0015] The present invention, roughly described, pertains to technology for identifying potential sources of memory leaks by tracking growth patterns of groups of stored items. One example of a group of stored items is an instance of a Java collection. If the growth pattern of a collection indicates that it may be the source**

of a memory leak, that collection is reported to a user and will continue to be tracked."), and identifying any software objects determined to have one or more analysis properties that exceeds that property's predetermined limit. **(Paragraph [0060] In step 322, it is determined whether the change counter is greater than the sensitivity counter. The sensitivity counter is a static number that corresponds to the sensitivity setting described above. For example, Table 2 shows that if the sensitivity setting is 10 then the sensitivity counter is 3, and if the sensitivity setting is 4 then the sensitivity counter is 7. Thus, the first time the first threshold is exceeded (e.g. where the threshold becomes 5.4), the change counter will equal 1, which is less than the sensitivity counter (step 332). Therefore, the collection is reported as not leaking in step 334. If the change counter is greater than the sensitivity counter, then the collection is reported as being a potential source of a leak in step 336. For example, if the sensitivity setting is 9, then the sensitivity setting will be 3. When the change counter is greater than 3, the collection will be reported as a potential source of a leak. In other words, when the size of the collection grows so that more than three thresholds have been exceeded, the collection is reported as being a potential source of a leak.").** Cirne does not explicitly teach: wherein the one or more specified analysis properties includes one of an object's age; determining if any analysis property of software objects being referenced following a garbage collection process exceeds a respective predetermined limit for such analysis property, wherein a predetermined limit for an object's age is an object age limit However, these limitations are taught by Fu: wherein the one or more

specified analysis properties includes one of an object's age. **(Column 5, Lines 59-66, "FIG. 3 illustrates an exemplary cutoff weighting subroutine 300 that simply discards old memory usage elements. Memory usage weighting subroutine 300 begins at block 301 and proceeds to looping block 305 where an iteration through each usage data element begins. The first step in the loop is decision block 310 where a determination is made whether the current usage data element is older than a threshold time.")** determining if any analysis property of software objects being referenced following a garbage collection process exceeds a respective predetermined limit for such analysis property, wherein a predetermined limit for an object's age is an object age limit**(Column 5, Lines 59-66, "FIG. 3 illustrates an exemplary cutoff weighting subroutine 300 that simply discards old memory usage elements. Memory usage weighting subroutine 300 begins at block 301 and proceeds to looping block 305 where an iteration through each usage data element begins. The first step in the loop is decision block 310 where a determination is made whether the current usage data element is older than a threshold time.")**. In addition it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Cirne with the object age comparison of Fu as: Cirne teaches the detection of memory leaks based on suspicious characteristics of object groups, wherein one of the characteristics is allocation time (see Cirne e.g. Paragraph [0052]). Also, Cirne teaches the comparison of another characteristic to a threshold (group size, referenced below). Finally, one of ordinary skill in the art would be motivated to combine the memory leak detection of Cirne with the object age threshold

of Fu as the an object age above the threshold could be another indicator of a potential memory leak in the system of Cirne.

Regarding Claims 2, 12 and 22, Cirne teaches: The limitations of claims 1, 11 and 21, further comprising the step of calculating an object's age by timing a current period starting when the respective object was instantiated **(Paragraph [0053] "The entry in the log file created in step 266 includes the following information: current timestamp when written to the log, an identification (ID) for the collection, the class of the collection, the allocation time of the collection, allocation stack trace for the collection, current size of the collection and ten sample elements in the collection (represented by class name, followed by the toString( ) representation capped at 20 characters).")**.

Regarding Claims 3, 13 and 23, Cirne teaches: The limitations of claims 1, 11 and 21,wherein the one or more specified analysis properties includes an object's includes an object's instance count having a predetermined limit that an object instance count growth value **(Paragraph [0059] "In step 320 of FIG. 5, the size of the collection is compared to a threshold. Remember, that the size of each collection is read every 7.5 seconds (or other interval). In one embodiment, the first time the size of a collection is read the threshold is set at zero. If the newly read size is not greater than the threshold (step 322), then the collection is reported as not leaking in step 324. If the new size is greater than the threshold, then a change counter is incremented in step 328. The change counter stores how many times the threshold has been changed. A new threshold is then created in step 330. The**

new threshold is created by multiplying the current value of the size of the collection by a growth factor. The growth factor is selected by the sensitivity setting described above in Table 2. Table 2 shows a growth factor for each particular sensitivity setting. For example, if the sensitivity setting is 7, then the growth factor is 1.15. If the sensitivity setting is 2, then the growth factor is 1.8. Therefore, if the current threshold is zero (e.g. the first time), the collection size is 3 and the growth factor is 1.8, then the new threshold will be 5.4.);; further comprising the step of calculating object instance count growth as the magnitude of growth of an object's instance count over a given time period **(Paragraph [0051] "At the time for repeating the process, Agent 8 first checks the size of each collection (step 262). Each collection stores its own size. Agent 8 will sweep through all of its weak references and make sure that each object is still present in the heap by performing a simple null check. For each object that is still there, Agent 8 will read the size of that collection. In step 264, Agent 8 will update the heuristics for each collection for which it received a size. The heuristics (to be described in more detail below) determines whether the collection is a potential source of a leak or not.")**.

Regarding Claims 4, 14 and 24, Cirne teaches: The limitations of claims 1, 11 and 21, wherein the step of monitoring comprises monitoring objects within a class designated for monitoring **(Paragraph [0018] "One implementation of the present invention includes a method of monitoring for potential stores of memory leaks. The method includes tracking the size of a first group of stored items and**

determining whether that first group of stored items is a potential memory leak source based on change in size of the first group of stored items.").

Regarding Claims 5, 15 and 25, Cirne teaches: The limitations of claims 1, 11 and 21, further comprising the step of performing a stack walkback for the identified software objects **(Paragraph [0049] "If leak detection is enabled and the time out period has not expired (step 206), then the code in the constructor for the collection object will create a stack trace for the collection object in step 208. In step 210, the code in the constructor for the collection object will pass a reference to the collection object and the stack trace to Agent 8.").**

Regarding Claims 6, 16 and 26, Cirne teaches: The limitations of claims 1, 11 and 21, further comprising the step of generating a statistics report comprising the identified software objects **(Paragraph [0016] "In one embodiment, the present invention includes looking for collections that appear to be growing in size. These collections are flagged as potential sources of leaks. The system then reports information for these collections as metric data as well as to a log file. If a flagged collection no longer appears to be leaking, that change in status will be reported; however, the system will continue tracking and reporting data for that collection.")**.

Regarding Claims 7, 17 and 27, Cirne teaches: The limitations of claims 6, 16 and 26, further comprising the step of generating a statistics report comprising the identified software objects **(Paragraph [0016] "In one embodiment, the present invention includes looking for collections that appear to be growing in size.**

These collections are flagged as potential sources of leaks. The system then reports information for these collections as metric data as well as to a log file. If a flagged collection no longer appears to be leaking, that change in status will be reported; however, the system will continue tracking and reporting data for that collection.").

Regarding Claims 8, 18 and 28, Cirne teaches: The limitations of claims 6, 16 and 26, further comprising the step of generating a web interface for user viewing of the statistics report at a computer display **(Paragraph [0032] "The workstations (e.g. 124 and 126) are the graphical user interface for viewing performance data.")**.

Regarding Claims 9, 19 and 29, Cirne teaches: The limitations of claims 1, 11 and 21, wherein the software objects are Java objects **(Cirne Paragraph "[0015] The present invention, roughly described, pertains to technology for identifying potential sources of memory leaks by tracking growth patterns of groups of stored items. One example of a group of stored items is an instance of a Java collection. If the growth pattern of a collection indicates that it may be the source of a memory leak, that collection is reported to a user and will continue to be tracked.")**.

Regarding Claims 10, 20 and 30 Cirne in view of Fu teaches the limitations of Claims 1, 11 and 21 respectively as described above. In addition Cirne further teaches: monitoring an amount of available memory for a software program referencing software objects **(Paragraph [0035] "A metric is a measurement of a specific application activity. Probes can be used to enable the reporting of a set of metrics for a**

managed application. Examples of metrics collected can include CORBA method timers, remote method indication method timers, thread counters, network bandwidth, JDBC update inquiry timers, servlet timers, Java Server Pages (JSP) timers, system logs, file system input and output bandwidth meters, availability and used memory, enterprise Java bean times, etc."); and upon such determination, storing a current stack walkback of currently referenced software objects prior to the amount of available memory for a software program referencing software objects dropping below an amount of available memory necessary to store a current stack walkback **(Paragraph [0049] "If leak detection is enabled and the time out period has not expired (step 206), then the code in the constructor for the collection object will create a stack trace for the collection object in step 208. In step 210, the code in the constructor for the collection object will pass a reference to the collection object and the stack trace to Agent 8." While the determination is not taught by Cirne as explained below, the storing of the current stack trace is inherently prior to reaching the threshold as Cirne allocates memory for the trace). Cirne does not explicitly teach:** determining when the amount of available memory for the software program referencing software objects is within a predetermined threshold amount of memory within zero memory available for the software program utilizing software objects However, official notice is taken that determining when the available memory hits a threshold would have been a well known technique in the art at the time of the invention. For example, such a determination is made in the issuance of "out-of-memory" errors and the like in the art. In addition it would have been obvious to

combine the teachings of Cirne with the well-known available-memory-determining-technique as this technique is well-known to be used in the art for determining when the effect of memory leaks have reached a critical point.

Response to Arguments

5. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. BROPHY whose telephone number is

571-2725-1642 . The examiner can normally be reached on Monday-Thursday 8:00AM-5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on (571) 272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJB

3/18/2008

/Wei Zhen/
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